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TO: Richard Fetzer, EPA Region 3 OSC

THROUGH: Ex. 4 - CBI, SERAS Program Manager

FROM: Ex. 4 - CBI SERAS QA/QC Officer

SUBJECT: SERAS Validation Procedures

INTRODUCTION

During a teleconference on May 17, 2012, Scientific, Engineering, Response and Analytical Services (SERAS) personnel were asked to provide a technical outline of the data assessment procedures used to review the data for the Dimock Groundwater project.

BACKGROUND

Based on a teleconference held on February 8, 2012 regarding the data for the Dimock Site, SERAS personnel agreed to conduct a data verification/completeness check that included the following items: 1) Manage data through the Scribe management system; 2) Ensure that data are available for each sample and parameter documented on each chain of custody record; 3) Read each case narrative from the Regional lab reports and each validation report from the EPA R3 Environmental Services Assistance Team (ESAT) for the outside contract labs and notify Environmental Response Team (ERT)/EPA Region 3 personnel of any potential "red" flags. "Red" flags will be defined as those items that may trigger a difference of opinion in how the data were qualified; and 4) Check electronic data deliverables (EDDs) to ensure that appropriate qualifiers have been entered; and 5) Import data from comma separated value (csv) files and check EDDs for complete and accurate data transfer. Items 1, 2 and 5 were completed by SERAS personnel either on-site or at the SERAS facility. Items 3 and 4 were conducted at the SERAS facility by Quality Assurance (QA) personnel.

During the project level review, the following assumptions were made by SERAS personnel: 1) SERAS assumed that all case narratives from the Regional labs and all case narratives from Region 3 ESAT have been reviewed in accordance with Regional or ESAT protocols and contain all pertinent and complete information required for SERAS personnel to conduct the completeness check; 2) SERAS relayed their comments to the EPA Region 3 On-Scene Coordinator, the Region 3 Office of Analytical Services & Quality Assurance (OASQA) Laboratory Branch Chief and the ERT Work Assignment Manager (WAM); and 3) SERAS received a response to the verification/completeness check from the EPA Region 3 OASQA Laboratory Branch Chief. SERAS had access to minimal data so all comments were based solely on the information available to SERAS personnel on the file transfer protocol (ftp) website and/or supplied during the Regional labs responses to SERAS comments.

VALIDATION PROTOCOLS

SERAS uses the USEPA Contract Lab Program National Functional Guidelines for Organic Data Review and the USEPA Contract Lab Program National Functional Guidelines for Inorganic Data Review as the basis for data review, modified to accommodate SW-846 and other EPA methods. These documents are designed to offer the data reviewer guidance in determining the usability of analytical data generated through the Contract Laboratory Program (CLP) Statement of Work (SOW) for Multi-Media, Multi-Concentration Organics Analysis (SOM01.3) and the CLP SOW for Multi-Media, Multi-Concentration Inorganics Analysis (ISM01.2) Other sources of guidance and information, the validators' experience as a data reviewer and analyst, as well as professional judgment, are also used in conjunction with these guidelines.

The following qualifiers are used by SERAS personnel to flag organic compound data. The definitions provide brief explanations of the national qualifiers assigned to organic results in the data review process. For non-CLP data, the Reporting Limit (RL) is used in place of the Contract Required Quantitation Limit (CRQL).

U	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the adjusted CRQL for sample and method.
J	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met, or the concentration of the analyte was below the CRQL).
UJ	The analyte was not detected at a level greater than or equal to the adjusted CRQL. However, the reported adjusted CRQL is approximate and may be inaccurate or imprecise.
R	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.

The following qualifiers are used by SERAS personnel to flag inorganic compound data. The definitions provide brief explanations of the national qualifiers assigned to inorganic results in the data review process. For non-CLP data, the RL is used in place of the quantitation limit.

U	The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
J	The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
J+	The result is an estimated quantity, but the result may be biased high.
J-	The result is an estimated quantity, but the result may be biased low.

R	The data are unusable. The sample results are rejected due to serious deficiencies in meeting Quality Control (QC) criteria. The analyte may or may not be present in the sample.
UJ	The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

The following qualifiers are used by SERAS personnel to flag radiochemical data. The definitions provide brief explanations of the qualifiers assigned to radiochemical results in the data review process. For radiochemical data, the minimum detectable concentration (MDC) is analogous to the RL.

U	The analyte was analyzed for, but was not detected at a level greater than or equal to the level of the MDC for sample and method.
J	The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample (due either to the quality of the data generated because certain quality control criteria were not met).
UJ	The analyte was not detected at a level greater than or equal to the MDC. However, the reported MDC may be approximate and may be inaccurate or imprecise.
R	The sample results are unusable due to the quality of the data generated because certain criteria were not met. The analyte may or may not be present in the sample.

Although the validation process by SERAS personnel typically also involves reviewing the instrument performance checks, minimum response factors (RFs) and relative standard deviations (RSDs) for initial and continuing calibrations, rechecking of sample calculations, verifying the internal standard areas and review of spectra for target compound identification, this verification/completeness check was limited to items that were included in the laboratory reports. The following paragraphs define how data were qualified by SERAS personnel. It must be noted that SERAS personnel always takes into consideration the accuracy and precision limits defined by the laboratory. For example, if the laboratory has a recovery range for a specific compound of 30 to 150%, the 30% becomes the lower recovery limit and the 150% becomes the upper limit.

Since the National Functional Guidelines (NFGs) only address the validation of volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCB), metals and cyanide, SERAS QA personnel used the data assessment criteria that most mimics one of the above categories. For example, the wet chemistry parameters followed the metals criteria. The action tables by parameter (i.e., volatile organic compound, semivolatile organic compound, etc.) listed below are those used by SERAS personnel to qualify data. For ease of understanding, the parameters analyzed for the Dimock Groundwater Site are cross-referenced to the action tables used below.

Parameter	Action Table Used
VOC	Volatile Organic Compounds
SVOC	Semivolatile Organic Compounds
Inductively-Coupled Plasma-Atomic Emission Spectrometry (ICP-AES) Metals	ICP-AES, ICP-MS and Mercury (Hg)
Inductively-Coupled Plasma-Mass Spectrometry (ICP-MS) Metals	ICP-AES, ICP-MS and Mercury (Hg)
Mercury	ICP-AES, ICP-MS and Mercury (Hg)
Alcohols (1-butanol, 2-butanol, ethanol, methanol, 1-propanol)	Modified Pesticide (GC Analysis)
Total Petroleum Hydrocarbons (TPH)-Extractables	Modified Pesticide (GC Analysis)
TPH-Purgeables	Modified Pesticide (GC Analysis)
Dissolved Gases (methane, ethane, ethene)	Modified Pesticide (GC Analysis)
Glycols by Region 3 (2-butoxyethanol, diethylene glycol, 2-methoxyethanol, tetraethylene glycol, triethylene glycol)	Modified Pesticide (GC Analysis)
Glycols by Region 6 (propylene glycol, ethylene glycol)	Modified Semivolatile Organic Compounds (GC/MS Analysis)
Glycols by Pace (ethylene glycol)	Modified Pesticide (GC Analysis)
Glycols by TestAmerica (ethylene glycol, triethylene glycol, diethylene glycol, 2-methoxyethanol, 2-ethoxyethanol)	Modified Pesticide (GC Analysis)
Methylene Blue Active Substances (MBAS),	Modified ICP-AES, ICP-MS and Mercury (Hg)
Anions (chloride, bromide, fluoride, sulfate)	Modified ICP-AES, ICP-MS and Mercury (Hg)
Oil & Grease	Modified ICP-AES, ICP-MS and Mercury (Hg)
Total Phosphorus	Modified ICP-AES, ICP-MS and Mercury (Hg)
Nitrate/Nitrite (NO_3/NO_2) as N	Modified ICP-AES, ICP-MS and Mercury (Hg)
Total Suspended Solids (TSS)	Modified ICP-AES, ICP-MS and Mercury (Hg)
Total Dissolved Solids (TDS)	Modified ICP-AES, ICP-MS and Mercury (Hg)
Total Nitrogen (N_2)	Modified ICP-AES, ICP-MS and Mercury (Hg)
Gross Alpha-Beta	SERAS Radiochemical Guidelines
Gamma	SERAS Radiochemical Guidelines
Radium (Ra)-226	SERAS Radiochemical Guidelines
Ra-228	SERAS Radiochemical Guidelines
Alpha Spec, Thorium	SERAS Radiochemical Guidelines
Alpha Spec, Uranium	SERAS Radiochemical Guidelines
Isotech**	Not Validated
Total Coliforms (TC), Fecal Coliforms (FC) and	SERAS Microbiological Guidelines

Heterotrophic Plate Count (HPC)	

**Due to the proprietary nature of the analysis, raw data were not available to validate

Qualifier Actions

1. **Blank Actions**

Blank Action for Volatile Organic Compound Analysis

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Field, Trip, Instrument	Detects	Not Detected	No qualification
	<RL*	<RL*	Report RL value with a U
		≥ RL*	U if <5x blank, raise RL to amount found in the sample
	>RL*	<RL*	Report RL value with a U
		≥RL* and < blank concentration	Report the blank concentration for the sample with a U or qualify the data as unusable R
		≥RL* and ≥blank concentration	U if <5x blank, raise RL to amount found in the sample
	=RL*	<RL	Report RL value with a U
		≥RL*	U if ≤5X blank – raise RL to level in sample

*5x the RL for common lab contaminants (methylene chloride, acetone, 2-butanone)

Blank Action for Semivolatile Organic Compound Analysis

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Field	Detects	Not detected	No qualification
	< RL*	< RL*	Report RL value with a U
		≥ RL*	Use professional judgment
	> RL*	≥ RL* and <blank concentration	Report the blank concentration for the sample with a U or qualify the data as unusable R
		≥ RL* and ≥ blank concentration	Use professional judgment
	= RL*	< RL*	Report RL with a U
		≥ RL	Use professional judgment
	Gross contamination	Detects	Qualify results as unusable R

*5x the RL for common lab contaminants (2-bis-ethylhexyl) phthalate)

Blank Action for Pesticide Analysis

Blank Type	Blank Result	Sample Result	Action for Samples	Action for RLs
Method, Cleanup, Field, Rinsate, Instrument, CO_2	Detects	Not detected	No Qualification	
	< RL	< RL	U	None
		≥ RL	U if <5x Blank	Raised to Concentration in sample or use professional judgment
	≥ RL	< RL	U	None
		≥ RL and <blank	U	RL raised to concentration in blank
		≥ RL and ≥ blank concentration	Use professional judgment. If U, RL raised to concentration in blank	
	Gross contamination	Detected	Qualify results as "R"	

Blank Action for ICP-AES, ICP-MS and Hg Analyses

Blank Type	Blank Result	Sample Result	Action for Samples
Initial Calibration Blank/Continuing Calibration Blank (ICB/CCB)	<10% frequency		Use professional judgment
ICB/CCB	>RL	Non-detect	No Action
ICB/CCB (ICP)		≥ RL < Blank	Raise RL to Blank concentration and report sample result with a "U".
		> RL > Blank	Use professional judgment or qualify sample results as estimated high (J+)
ICB/CCB (ICP and Hg)	<(-RL)	<10x the RL	Qualify results ≥ RL as estimated low (J-) Qualify non-detects as estimated (UJ)
ICB/CCB (Hg only)	Absolute value is >RL	>RL but < Blank Result	Raise RL to Blank concentration and report sample result with a "U" or qualify data as unusable (R)
		>Blank Result	Use professional judgment
MB (ICP/Mercury)	>RL	≤RL	Report RL with a "U"
		≥RL but < 10x Blank Result	Qualify results as estimated high (J+)
		>10x Blank Result	No Action
	< (-RL)	<10x the RL	Qualify results that are ≥RL as estimated low (J-) Qualify non-detects as estimated (UJ)

Blank Action for Radiochemical Data

Normalized Absolute Difference (NAD)	Sample Result Qualification
> 2.58	None
1.96 > x < 2.58	J
x < 1.96	J*

* = Minimally the result should be qualified as estimated, J; however, if other quality indicators are deficient, the validator may determine the result should be qualified unusable "R".

Method Blank Action for HPC/E coli

Criteria	Action for Samples
<RL	No Action
≥RL	Positive results are biased high
No Associated Method Blank	Positive results may be biased high due to agar contamination or contamination during sample analysis.

Field Blank Action for HPC/E coli

Criteria	Action for Samples

<RL	No Action
≥RL	Result is biased high
No Associated Field Blank	Positive results may be biased high

2. Laboratory Control Sample (LCS) Actions

LCS Percent Recovery Action for Volatile Organic Compound Analyses

Criteria	For all associated samples	
	Detected Compounds	Non-Detected Compounds
Lower limit ≤ % Recovery ≤ Upper limit	No qualification	
% Recovery > Upper limit	J	No qualification
Recovery < Lower limit > 20%	J	J
Recovery < Lower limit < 20%	J	R

LCS Percent Recovery Action for Semivolatile Organic Compound Analysis

Criteria	For all associated samples	
	Detected Compounds	Non-Detected Compounds
Lower limit ≤ % Recovery ≤ Upper limit	No qualification	
% Recovery > Upper limit	J	No qualification
% Recovery < Lower limit > 20%	J	J
% Recovery < Lower limit < 20%	J	R

LCS Percent Recovery Action for Pesticide Analysis

Criteria	For all associated samples	
	Detected Compounds	Non-Detected Compounds
Lower Limit ≤% Recovery ≤Upper Limit	No Qualification	
% Recovery > Upper Acceptance limit	J	No Qualification
% Recovery < Lower Acceptance Limit	J	R

LCS Action for Radiochemical Data

Criteria	For all associated samples	
	Detected Compounds	Non-Detected Compounds
Lower Limit ≤ % Recovery ≤ Lower Limit	No Qualification	
% Recovery > Upper Limit and NAD <1.96	J	No Qualification
-1.96 < NAD < 1.96	No Qualification	
1.96 < NAD <2.58 or (-1.96 < NAD < -2.58)	J	No Qualification
NAD < -1.96	No Qualification	UJ
-2.58 > NAD > 2.58	R	R

Positive Control Action for HPC

Criteria	Action for Samples
Analyzed	No Action
Not Analyzed	Results may be biased low

LCS Percent Recovery Action for ICP-AES, ICP-MS and Hg Analyses

Criteria	Action for Samples
No LCS or Blank Spike/Blank Spike Duplicate (BS/BSD) analyzed	Qualify results that are ≥RL as estimated (J) Qualify non-detects as unusable (R)
Soil/Aqueous - Lab-Prepared %R between 80-120% (except for antimony [Sb] and silver [Ag] in ICP-AES) Within Soil/Water Upper and Lower Control Limits (UCL and LCL) for Vendor Certified Sample	No Action, Acceptable range
Aqueous/Non-Aqueous - Lab-Prepared % R between 50-79%	Qualify results that are ≥ RL as estimated low (J-) Qualify non-detects as estimated (UJ)
Aqueous/Non-Aqueous - Lab-Prepared %R >120%	Qualify results that are ≥ RL as estimated high (J+) Non-detects are acceptable.
Aqueous/Non-Aqueous - Lab-Prepared	Qualify results that are ≥ RL as estimated low (J-)

%R <50%	Qualify non-detects as unusable (R)
Aqueous/Non-Aqueous - Lab-Prepared %R> 150%	Qualify all results as unusable (R)
Aqueous/Non-Aqueous result >UCL - Vendor Certified Sample	Qualify results that are ≥ RL as estimated high(J+) Non-detects are acceptable
Aqueous/Non-Aqueous result <LCL - Vendor Certified Sample	Qualify results that are ≥ RL as estimated low (J-) Qualify non-detects as estimated (UJ)

3. **Matrix Spike/Matrix Spike Duplicate (MS/MSD) Actions**

MS/MSD Percent Recovery Action for Volatile Organic Compound Analysis

Criteria	For Spiked Sample	
	Detected Compounds	Non-Detected Compounds
Lower Limit ≤ % recovery ≤ Upper Limit	No qualification	
RPD or % Recovery > Upper Limit	J	No Qualification
20% ≤ % Recovery < Lower Limit	J	UJ
Recovery < 20%	J	R

MS/MSD Percent Recovery Action for Semivolatile Organic Compound Analysis

Criteria	For Spiked Sample	
	Detected Compounds	Non-Detected Compounds
Lower Limit ≤ % recovery ≤ Upper Limit	No qualification	
RPD or % Recovery > Upper Limit	J	No Qualification
% Recovery < Lower Limit	J	UJ
% Recovery < 20%	J	Professional Judgment or R

MS/MSD Percent Recovery Action for Pesticide Analysis

Criteria	Action - only for Sample Spiked	
	Detected Compounds	Non-Detected Compounds
Lower Limit ≤ % Recovery ≤Upper Limit	No Qualification	
RPD or % Recovery > Upper limit	J	No Qualification
20 ≤ % Recovery < Lower Limit	J	UJ
% Recovery < 20%	J	Use Professional Judgment

MS/MSD Percent Recovery Action for ICP-AES, ICP-MS and Hg Analyses

Criteria	Action for Samples
MS %R for sample concentrations <4x spike concentration 75%-125%	No Action
MS %R for sample concentration ≥4x spike concentration.	Qualify % R data as not calculated (NC)
ICP: MS %R <30% and/or Post-Digestion spike %R<75%	Qualify affected results ≥ RL as estimated low (J-) Qualify non-detects as unusable (R)
Hg: MS %R < 30%	
ICP: MS %R <30% and/or Post-Digestion spike ≥75%	Qualify affected results are ≥ RL as estimated (J) Qualify non-detects as estimated (UJ)
ICP: MS %R 30-74% Post-Digestion spike %R≥75%	Qualify affected results are ≥ RL as estimated (J) Qualify non-detects as estimated (UJ)
Hg: MS %R 30-74%	Qualify affected results are ≥ RL as estimated low (J-) Qualify non-detects as estimated (UJ)
ICP: MS %R 30-74% and/or Post Digestion spike %R<75%	Qualify affected results are ≥ RL as estimated low (J-) Qualify non-detects as estimated (UJ)
ICP: MS %R > 125% and/or Post Digestion spike %R >125%	Qualify affected results ≥RL as estimated high (J+) Non-detects are not affected.
Hg: MS %R >125%	
ICP: MS %R > 125% Post Digestion spike %R≤ 125%	Qualify affected results ≥ RL as estimated (J) Non-detects are not affected.

MS Percent Recovery Action for Radiochemical Data

Criteria	Action for Associated Sample	
	Detected Compounds	Non-Detected Compounds
Lower Limit ≤ % Recovery ≤Upper Limit	No Qualification	
Upper Limit < % Recovery < 150%	J	No Qualification
20% < % Recovery < Lower Limit		
150% < % Recovery <20%	R	R
The NAD qualifications below apply if the % Recovery is exceeded for either the upper or lower limits defined by the laboratory		
-1.96 ≤ NAD ≤ 1.96	No Qualification	
1.96 < NAD < 2.58	J	No Qualification
-1.96 < NAD < -2.58	J	UJ
2.58 < NAD < -2.58	R	R

4. Duplicate Sample Actions

Duplicate Sample Action for ICP-AES, ICP-MS and Hg Analyses

Criteria	Action for Samples
Both sample and duplicate sample results >5 times the RL and %RPD >20	Qualify results greater than the RL as estimated (J) and non-detects as estimated (UJ)
Sample and duplicate sample results ≤5 times the RL (including non-detects)	No qualification of data

Duplicate Sample Action for Radiochemical Data

Criteria	Action for Associated Samples	
	Detected Compounds	Non-Detected Compounds
NAD ≤ 1.96	No Qualification	
Water: NAD ≥ 1.96 and ±25% RPD	J	No Qualification
Water: RPD > 50%	R	No Qualification

Duplicate Plate Action for HPC

Criteria	Action for Samples
Duplicate Analyzed	No Action
Duplicate Not Analyzed	Result is less accurate; Biased high or low

5. Internal Standard Actions

Internal Standard Area Action for Volatile Organic Compound Analysis

Criteria	Action	
	Detected Compounds	Non-Detected Compounds
Area Counts ≥ 50% and ≤ 200% of CCV or Initial Calibration Point	No Qualification	
Area Counts > 200% of CCV or Initial Calibration Point	J	No Qualification
Area Counts < 50% of CCV or Initial Calibration Point	J	R
RT difference ≤ 30 seconds of CCV or Initial Calibration Point	No Qualification	
RT difference > 30 seconds of CCV or Initial Calibration Point	R or Professional Judgment	

Internal Standard Area Action for Semivolatile Organic Compound Analysis

Criteria	Action	
	Detected Associated Compounds	Non-Detected Associated Compounds
Area Counts ≥ 50% and ≤ 200% of CCV or Initial Calibration Point	No Qualification	
Area Counts > 200% of CCV or Initial Calibration Point	J	No Qualification
Area Counts < 50% of CCV or Initial Calibration Point	J	R*
RT difference ≤ 30 seconds of CCV or Initial Calibration Point	No Qualification	
RT difference > 30 seconds of CCV or Initial Calibration Point	R or Professional Judgment	

6. Surrogate Recovery Actions

Surrogate Recovery Action for Volatile Organic Compound Analysis

Criteria	Action	
	Detected Compounds	Non-Detected Compounds
Lower Limit ≤ %R ≤ Upper Limit	No Qualification	
% R > Upper Limit	J	No Qualification
20% ≤ %R < Lower Limit	J	UJ
% R < 20%	J	R
No Surrogates Added	J	J

Surrogate Recovery Action for Semivolatile Organic Compound Analysis

Criteria	Action (For affected fraction)	
	Detected Compounds	Non-Detected Compounds

Lower Limit ≤ % Recovery ≤ Upper Limit	No Qualification	
> Upper limit (2 surrogates/fraction)	J	No Qualification
< Lower Limit (2 surrogates/fraction)	J	UJ
1 surrogate > Upper Limit & 1 surrogate < Lower Limit	J	UJ
< 10% (1 surrogate)	J	R
No surrogates added	J	J

Tracer/Carrier Recovery Action for Radiochemical Data

Criteria	Action	
	Detected Compounds	Non-Detected Compounds
Lower Limit ≤ % Recovery ≤ Upper Limit	No Qualification	
Upper Limit < % Recovery < 150	J	UJ
20% < % Recovery < Lower Limit		
150% < % Recovery < 20%	R	R

7. Initial Calibration Actions

Initial Calibration Action for Volatile Organic Compound Analysis

Criteria for Initial Calibration	Action	
	Detected Compounds	Non-Detected Compounds
% RSD ≤ 20%	No Qualification	
% RSD >20% but <50%	J	No Qualification
%RSD ≥ 50% but < 90%	J	UJ
% RSD ≥ 90%	J	R
RRF_{avg} <minimum RRF in Table 4 (Method 8260C).	J	R
Linear r^2 < 0.98	Use % RSD Action	Use % RSD Action
Quadratic r < 0.99	Use % RSD Action	Use % RSD Action

Initial Calibration Action for Semivolatile Organic Compound Analysis

Criteria for Initial Calibration	Action	
	Detected Compounds	Non-Detected Compounds
% RSD ≤ 20%	No Qualification	
% RSD > 20% but < 50%	J	No Qualification
% RSD ≥ 50% but < 90%	J	Use Professional Judgment
% RSD ≥ 90%	J	R
RRF_{avg} <Table 4 criteria (Method 8270D)	J	R
%D (ICV) >30%	J	Use Professional Judgment
Linear r^2 <0.98	Use % RSD Action	Use % RSD Action
Quadratic r <0.99		

Initial Calibration Action for Pesticide Analysis

Criteria for Pesticide Analysis	Action	
	Detected Compounds	Non-Detected Compounds
Initial calibration not performed or not performed in the proper sequence	Qualify as unusable "R" or use Professional Judgment	
%RSD≤20.0%	No Qualification	
20% < % RSD ≤ 50%	J	No Qualification
% RSD > 50% but ≤ 90%; r < 0.99	J	UJ
% RSD > 90%	J	R

8. Continuing Calibration Actions

Continuing Calibration Action for Volatile Organic Compound Analysis

Criteria for Opening CCV	Criteria for Closing CCV (If analyzed)	Action	
		Detected Compounds	Non-Detected Compounds
% D ≤ 20%	%D ≤ 50%	No Qualification	
% D ≤ 20%	% D > 50 %	J	UJ
% D > 20% but ≤ 50%	% D > 50%	J	U
% D > 50% but ≤ 90 %	% D > 50%	J	UJ
% D > 90 %	% D > 50 %	J	R
RRF <minimum RRF in Table 4 (Method 8260C).	RRF <minimum RRF in Table 4 (Method 8260C).	J	R
Outside 12 hour window		J or use professional judgment	R

Continuing Calibration Action for Semivolatile Organic Compound Analysis

Criteria for Opening CCV	Criteria for Closing CCV (If analyzed)	Action	
		Detected Compounds	Non-Detected Compounds
% D ≤ 20%	%D ≤ 50%	No Qualification	
% D ≤ 20%	% D > 50 %	J	UJ
% D > 20% but ≤ 50%	% D > 50%	J	U
% D > 50% but ≤ 90 %	% D > 50%	J	UJ
% D > 90 %	% D > 50 %	J	R
RRF < minimum values (Table 4 criteria – Method 8270D)		J	R
Outside 12 hour window		J or use professional judgment	R

Continuing Calibration Verification Standard Action for Pesticide Analyses

Criteria for Pesticide Analysis	Action for Samples Bracketed by Verification Standard	
	Detected Compounds	Non-Detected Compounds
% D ≤ 20 %	No Qualification	
% D > 20% but < 50%	J	No Qualification
% D ≥ 50% but < 90%	J	UJ
% D ≥ 90% using Professional Judgment	J	R
Time elapsed > 12 hr (analytical sequence) or > 14 hr (to closing CCV)	R	R
RT exceeds window	Use Professional Judgment	

9. Holding Time, Temperature and Preservation Actions

Holding Time Action for Volatile Organic Compound Analysis

Matrix	Preserved (≤6°C)	Criteria	Action	
			Detected Compounds	Non-Detected Compounds
Aqueous	No	≤ 7 days	No Qualification	
	No	> 7 days	J	R
Aqueous, pH<2	Yes	≤ 14 days	No Qualification	
	Yes	> 14 days	J	R
Non-Aqueous	No	≤ 14 days	J	R or Professional Judgment
	Yes	≤ 14 days	No Qualification	
	Yes/No	> 14 days	J	R

Holding Time Action for Semivolatile Organic Compound Analysis

Matrix	Preserved at ≤6°C	Holding Time Criteria	Action	
			Detected Associated Compounds	Non-Detected Associated Compounds
Aqueous	>6°C	≤ 7 days (extraction) ≤ 40 days (analysis)	Use Professional Judgment	
	>6°C	> 7 days (extraction) > 14 days (analysis	Use Professional Judgment	
	Yes	≤ 7 days (extraction) ≤ 40 days (analysis)	No Qualification	
	Yes	> 7 days (extraction) > 40 days (analysis)	J	UJ
	Yes/No	> 14 days (extraction) > 50 days (analysis)	J	UJ or R
Non-Aqueous	>6°C	≤ 14 days (extraction) ≤ 40 days (analysis)	Use Professional Judgment	
	>6°C	>14 days (extraction) > 40 days (analysis))	Use Professional Judgment	
	Yes	≤ 14 days (extraction) ≤ 40 days (analysis)	No Qualification	
	Yes	>14 days (extraction) > 40 days (analysis))	J	UJ
	Yes/No	>28days(extraction) >50 days (analysis)	J	UJ or R

Holding Time Action for Pesticide Analysis

Matrix	**Temperature Criteria Passed**	**Holding Time Criteria**		**Action**	
		Extraction	**Analysis**	**Detected Compounds**	**Non-Detected Compounds**
Aqueous	No	≤ 7 days	≤ 40 days	Use Professional Judgment	
	No	> 7 days	> 40 days	Use Professional Judgment	
	Yes	≤ 7 days	≤ 40 days	No Qualification	
	Yes	> 7 days	> 40 days	J	UJ
	Yes/No	> 14 days	> 50 days	J	UJ or R
Non-Aqueous	No	≤ 14 days	≤ 40 days	Use Professional Judgment	
	No	> 14 days	> 40 days	Use Professional Judgment	
	Yes	≤ 14 days	≤ 40 days	No Qualification	
	Yes	> 14 days	> 40 days	J	UJ
	Yes/No	> 28 days	> 50 days	J	UJ or R

Holding Time Action for ICP-AES, ICP-MS and Hg

Preservation Results	Action for Samples:
Aqueous metals samples received with pH≥2 and pH not adjusted.	Use professional judgment based on pH of sample: Qualify results that are ≥ RL as estimated low (J-) Qualify non-detects as unusable (R)
Sample Temperature Not Maintained	**Action for Samples:**
Aqueous/Water & Soil/Sediment samples not maintained at ≤6°C).	Use professional judgment based on temperature of the sample. Qualify results that are ≥ RL as estimated low (J-) Qualify non-detects as unusable (R)
Holding Time	**Action for Samples:**
Holding time exceeded(water/soil): Metals>180 days, mercury >28days	Use professional judgment based on additional time compared to technical requirements. Qualify results that are ≥ RL as estimated low (J-) Qualify non-detects as unusable (R)
TCLP and SPLP Holding Times exceeded: Metals >180 days from collection to extraction Metals >180 days from extraction to analysis Mercury >28 days from collection to extraction Mercury >28 days from extraction to analysis	Use professional judgment Qualify results that are ≥ RL as estimated low (J-) Qualify non-detects as unusable (R)

TCLP = Toxicity Characteristic Leaching Procedure
SPLP = Synthetic Precipitation Leaching Procedure

Holding Time Action for Radiochemical Data

Holding Time	Action for Samples
If samples with radionuclides amenable to preservative with acid have not been acidified in the field, but have been acidified in the laboratory prior to sub-sampling	No qualification
No evidence of preservation	Qualify sample results less than (<) MDA as estimated "UJ" Use professional judgment for sample results ≥ MDA

Holding Time Action for HPC

Criteria	Action for Samples
< 8 hours	No Action
≥ 8 Hours	Depending on water quality; Results may be biased low, high or not affected.

Holding Time Action for Fecal Coliform

Criteria	Action for Samples
< 30 hours	No Action
≥ 30 Hours	Depending on water quality; Results may be biased low, high or not affected.

Transport Temperature Actions for Fecal Coliform or HPC

Criteria	Action for Samples
< 10°C	No Action
≥ 10°C or No temperature recorded	Results are biased high

10. Radiochemical Quantification and MDC Actions

Sample Result (x)	Action	
	Detected Compounds	Non-Detected Compounds
If x >MDC and x >2s	No Qualification	
If 2s < x < MDC	UJ	NA
If 2s < x < MDC and 2s x 1.65 ≥ MDC	UJ	NA
If |-x| > 2s	R	NA
If |-x| < 2s and 2s x 1.65 < MDC	U	NA
If |-x| < 2s and 2s x 1.65 ≥ MDC	UJ	NA
If MDC < x < 2s and 2s x 1.65 ≥ MDC	UJ	NA

If 2s < X < MDC and 2s x 1.65 < MDC	J	NA
If x < 2s and x < MDC	U	NA
If x < 2s and x < MDC and 2s x 1.65 ≥ MDC	UJ	NA

2s = 2-sigma counting uncertainty, NA = Not Applicable, MDC = Minimum Detectable Concentration

INFORMATION TRANSFER

SERAS personnel prepared and submitted Verification/Completeness Checks to the EPA Region 3 OASQA Laboratory Branch Chief and the OSC. Each of these checks was forwarded to the respective Regional laboratory, NAREL or to the OASQA Technical Services Branch Chief for EPA-contracted laboratories by the EPA Region 3 OASQA Laboratory Branch Chief for comments. The EPA Region 3 OASQA Laboratory Branch Chief then forwarded the responses back to SERAS.

RECONCILIATION OF DIFFERENCES

For any differences of opinion in how the final data would be qualified, SERAS and EPA personnel discussed what options were available until an agreement satisfying Regional and SERAS validation protocols was reached. SERAS then provided guidance to the on-site SERAS personnel on the appropriate qualifiers to be entered into the Scribe data management system.

For glycols analyzed by GC, SERAS does not qualify data that is reported under the RL based on the EPA SW-846 criterion that the reporting limit for the analysis is typically based on the lowest calibration standard on the calibration curve. It is Regional policy that any concentration above the method detection limit (MDL) but under the RL is subjected to the Regional data validation guidelines. In addition, SERAS uses a 7-day holding time for aqueous samples for glycols. Regional policy indicates a 14-day holding time. For glycols, qualifications were based on the Regional policy.

For the inorganic data, specifically copper, NO_3/NO_2, chloride and TDS, SERAS only qualifies data based on method or preparation blank contamination as per the tables above. There was some concern by EPA Region 3 personnel that the use of a J+ qualifier did not provide enough information on the level of contamination found in either the method/preparation blank or the field blank. A consensus decision was made to elevate the RL for those samples associated with contamination either in the method or field blank. If the concentration found in the sample was less than the RL, a non-detect "U" was reported for this sample.